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ABSTRACT

Sixty subjects were identified from two grade levels (second and fifth), in elementary schools in Iowa and in Jordan. Cognitive and moral judgment tasks were administered to each subject. The cognitive tasks measured conservation, class inclusion, multiplicative classification, and spatial perception. The moral judgment tasks presented situations related to reciprocity, values, and perspective of viewpoints. Significant differences were found in the following relationships: the relationship of cognitive development between second- and fifth-grade subjects within each culture and between cultures, the relationship of moral development between second- and fifth-grade subjects within each culture and between the cultures, and the relationship of moral and cognitive development within and between the cultures. (BB)

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THE RELATIONSHIP OF MORAL AND COGNITIVE DEVELOPMENT IN TWO CULTURES AND THE IMPLICATIONS FOR SCIENCE TEACHING

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THE RELATIONSHIP OF MORAL AND COGNITIVE DEVELOPMENT
IN TWO CULTURES AND THE IMPLICATIONS FOR SCIENCE TEACHING

Science educators have been encouraged to focus on science and its relation to the affairs of man (Hurd, 1973), and to teach moral values through science (Fox, 1973). However, science curriculums have been structured to promote the cognitive growth of students. In order to focus on science related social issues and to effectively teach moral values through science, the science educator needs to examine the relationship of moral judgment and cognitive skills.

Piaget (1932) first proposed a relationship between moral and intellectual development. Kohlberg (1968, 1971) empirically verified and expanded the position of Piaget. Kohlberg (1976) stated that "since moral reasoning is clearly reasoning, advanced moral reasoning depends upon advanced logical reasoning. There is a parallelism between an individual's logical stage and his moral stage (p. 32)." Logical development is a necessary condition for moral development, but it is not sufficient. An individual may be at a higher logical stage (formal operational) than a parallel moral stage (post-conventional) but, according to Kohlberg, essentially none are at a higher moral stage than their logical stage.

Studies in the American culture (Damon, 1973; Mays, 1974; Tomlinson-Keasey & Keasey, 1974) have been reported which claim to support the parallelism of intellectual development and cognitive-moral development described by Piaget and Kohlberg. These studies focused primarily on parallelism by relating performance on cognitive and moral development tasks. The research did not elucidate variables dealing with the subject's social interaction with his/her environment.

Simpson (1974) has presented vigorous criticism of Kohlberg's methodology and conclusions, and she suggests that one needs to have a sensitive awareness of the differential values and patterns of thinking reflective to each culture in cross-cultural research in the area of moral development. This approach would provide further insights into the methodology, the data analysis, and the interpretation of studies related to the cognitive and moral development of individuals within and across cultures.

Problem

The purpose of this study was to examine possible relationships of moral and cognitive development in and between two cultures, Jordanian and American. The independent variables in this study were grade level, sex, and the country of origin, while the dependent variables were performance on four cognitive tasks and four moral judgment tasks.

The following relationships were examined in the study:

1. cognitive development between second and fifth grade subjects within each culture and between the cultures.
2. moral development between second and fifth grade subjects within each culture and between the cultures.
3. cognitive and moral development within each culture.

Sample

One hundred twenty subjects were selected randomly from two elementary schools, one in Amman Jordan and the other in Iowa City, Iowa. The sixty Jordanian subjects attended private school and came from medium and high socio-economic backgrounds. The sixty American subjects attended public school and came from socio-economic backgrounds reflecting the middle and upper middle class population. The instructional system in both schools was classified as innovative within the respective cultures.

The subjects in the two cultures were from the second and fifth grade level. The number of boys and girls in the second grade of both cultures was equal with a sample total of thirty for each culture. Four of the fifth grade Jordanian male subjects were deleted from the sample due to unavailability resulting from illness or transfer. In the Jordanian fifth grade sample, the number of male subjects to female subjects was 10-16, whereas the American sample was 12-18. The Jordanian second grade subjects age ranged between 7.0-8.5 years with a median of 8.0 years, and between 9.11-12.10 years with a median of 11.3 years for the fifth grade. The second grade American subjects age ranged between 7.7-8.7 years with a median of 8.0 years and the median age of fifth grade subjects was 11.0 years with an age range between 10.5-11.6 years.

Instrumentation

The cognitive levels of the subjects were measured by four Piaget-type tasks used by Inhelder and Piaget (1964) and Piaget (1965). However, one of these four tasks, "C_4 - Complementary Perspectives" was designed by Mays (1974) based on the child's concept of space as described by Piaget (1967). These tasks were prepared to assess the ability of the child to "decenter" or the ability to consider two or more variables or viewpoints simultaneously. The tasks were:

Task C_1: Conservation of Continuous Quantity (liquid amount)

Task C_2: Primary Addition of Classes..."Cow-Pig" task
(Jordanian subjects - "Cow-Rabbit" task)

Task C_3: Bi-univocal Multiplication of Classes..."Flowers" task

Task C_4: Comolementary Perspectives..."Cars and Trucks" task

The ability to consider viewpoints other than oneself in conflict situations was measured by the moral judgment tasks. Three of the four story tasks were

designed and tested by Lee (1971). These tasks were modified versions of Kohlberg's (1958) dilemmas. The fourth task, "Perspective of Viewpoints," which examined perspective moral reasoning was first reported by Lerner (1937) and later by MacRae (1954).

Each task consisted of a story which contained a conflict situation. The child listened to the story and then responded to specific pertinent questions giving his/her viewpoint as well as those of the story characters as they had perceived the dilemma. The tasks were:

Task M_1: Reciprocity...Life and Punishment

Task M_2: Conservation of Values...Promise and Peer Relationship

Task M_3: Perspective of Viewpoints...Peer Needs and Rules

Task M_4: Reciprocity...Citizen's Role and Punishment

The scoring criteria for the cognitive tasks were based on the student's ability to give logical responses relative to each task (Inhelder and Piaget, 1964; Piaget, 1965, 1967). Criteria established by Kohlberg (1972) were used as the substructure in scoring the moral judgment of the student on each task.

The eight tasks can be found with more detailed information of task descriptions and the scoring criteria for each task in Mays' (1974) original study.

Procedure

The tasks were administered individually to each subject in a small room located in each of the schools in the study. The tasks were translated by Kishta to Arabic for use with the Jordanian sample. The translation was piloted and underwent two revisions prior to use in this study. The administration of the tasks was conducted by the authors. The scoring of the student responses to the tasks was done by the researchers. The interrater reliability was established at the 94 percent level for the American subjects' responses.

The performance of the subjects on the cognitive tasks was rated either pass or fail at the concrete operational level. The moral judgment task performance was classified either preconventional or conventional.

Results and Discussion

On the basis of the population, the data-type and the sample sizes, the chi-square test of independent samples was performed to test relationships examined in this study. The expected cell frequencies were small, therefore, the Yates' correction for continuity was incorporated in the computation to reduce any possible marked discontinuity in the actual sampling distribution of chi-square (Ferguson, 1971).

Table I indicates that fifth grade subjects in each culture were more advanced cognitively compared to second grade subjects on tasks C_1, C_2, and C_3. The degree of advancement varied within and between cultures on the cognitive tasks. The results are consistent with the research in this area, i.e., grade level was a significant factor (Lee, 1971; Damon, 1973; Mays, 1974).

Task C_2 performance as reported in Table II favored the American sample at the second and fifth grade level. The American fifth grade subjects were more advanced than Jordanian subjects at the same grade level on C_4. The nature of these two tasks favors the American experience. Task C_4 required the control of more variables than C_2. The extent of significance on C_2 may be inherent within the task or it may be a linguistic-listening problem within the culture.

Table III presents the relationship of grade level and ability to perform on the moral judgment tasks. Consistency between grade levels within cultures is shown for M_2 and M_4. Comparing performance cross-culturally the results in Table IV indicate that more fifth grade subjects in the American sample exhibited conventional reasoning on M_3.

Table I

Test for Relationship in Performance of Second and Fifth Grade Subjects on Each Cognitive Task Within Each Culture

	Jordanian Subjects		American Subjects	
Task	Chi-Square	P	Chi-Square	P
C_1	17.12	< .001 ***	6.43	< .05 *
C_2	11.22	< .001 ***	5.88	< .05 *
C_3	10.32	< .01 **	7.55	< .01 **
C_4	1.68	> .10	5.68	< .05 *

df = 1
* significant at the .05 level
** significant at the .01 level
*** significant at the .001 level

Table II

Test for Relationship in Performance of Second Grade Subjects and of Fifth Grade Subjects on Each Cognitive Task Between Cultures

	Second Grade Subjects		Fifth Grade Subjects	
Task	Chi-Square	P	Chi-Square	P
C_1	2.47	> .10	0.04	> .80
C_2	22.84	< .001 **	13.78	< .001 **
C_3	0.12	> .90	1.11	> .20
C_4	0.27	> .50	6.13	< .02 *

df = 1
* significant at the .02 level
** significant at the .001 level

Table III

Test for Relationship in Performance of Second and Fifth Grade Subjects on Each Moral Judgment Task Within Each Culture

	Jordanian Subjects		American Subjects	
Task	Chi-Square	P	Chi-Square	P
M_1	1.53	> .20	2.59	> .10
M_2	5.55	< .05 *	7.55	< .01 **
M_3	0.38	> .80	11.09	< .001 ***
M_4	5.18	< .05 *	6.67	< .01 **

df = 1
* significant at the .05 level
** significant at the .01 level
*** significant at the .001 level

Table IV

Test for Relationship in Performance of Second Grade Subjects and of Fifth Grade Subjects on Each Moral Judgment Task Between Cultures

	Second Grade Subjects		Fifth Grade Subjects	
Task	Chi-Square	P	Chi-Square	P
M_1	1.67	> .10	0.86	> .30
M_2	1.30	> .20	0.59	> .30
M_3	0.0		7.16	< .01 *
M_4	0.28	> .80	0.08	> .70

df = 1
* significant at the .01 level

The results of performance on M_3 (Table IV) are interpreted as reflecting the high regard that the Jordanian subjects have for the position of the adult, in particular the teacher, whereas American subjects at the fifth grade level are more sensitive to peer influence.

The logical reasoning pattern (Table II) favoring the American sample on the cognitive tasks would according to the parallelism concept of Kohlberg favor conventional reasoning (Table IV) on the moral judgment tasks. Evidence of this was not observed, rather the contrary. The Jordanian sample lead the American sample in conventional reasoning on three of the four moral judgment tasks (Figure 1, 2).

The emphasis on moral character building in the total Jordanian environment, i.e., home, school, and community accounts for the anomaly in Figure 2. The strong emphasis on the development of cognitive skills in the American curriculum seems to account for the advancement of the second grade subjects, however a similar degree of advancement is not observable among the fifth grade subjects (Figure 1).

The relationship between the subject's performance on cognitive tasks and the moral judgment tasks (Table V) was established in the Jordanian culture for C_1 and M_4, C_2 and M_4, and in the American culture for C_4 and M_3. A subject's ability to handle quantitative relations about concrete things appears to be related to one's ability to recognize the role of a person in relation to others.

The cognitive-moral relationship is not invariant cross-culturally as evident in Table 5. The C_4-M_3 relationship observed in the American culture is not observed in the Jordanian culture. The C_1-M_4 and C_2-M_4 observed in the Jordanian culture is not observed in the American culture. It appears that cultural invariance would precede cognitive-moral invariance.

FIGURE 1

Percentages of Subjects

Passing Each Cognitive Task

In Each Grade Level

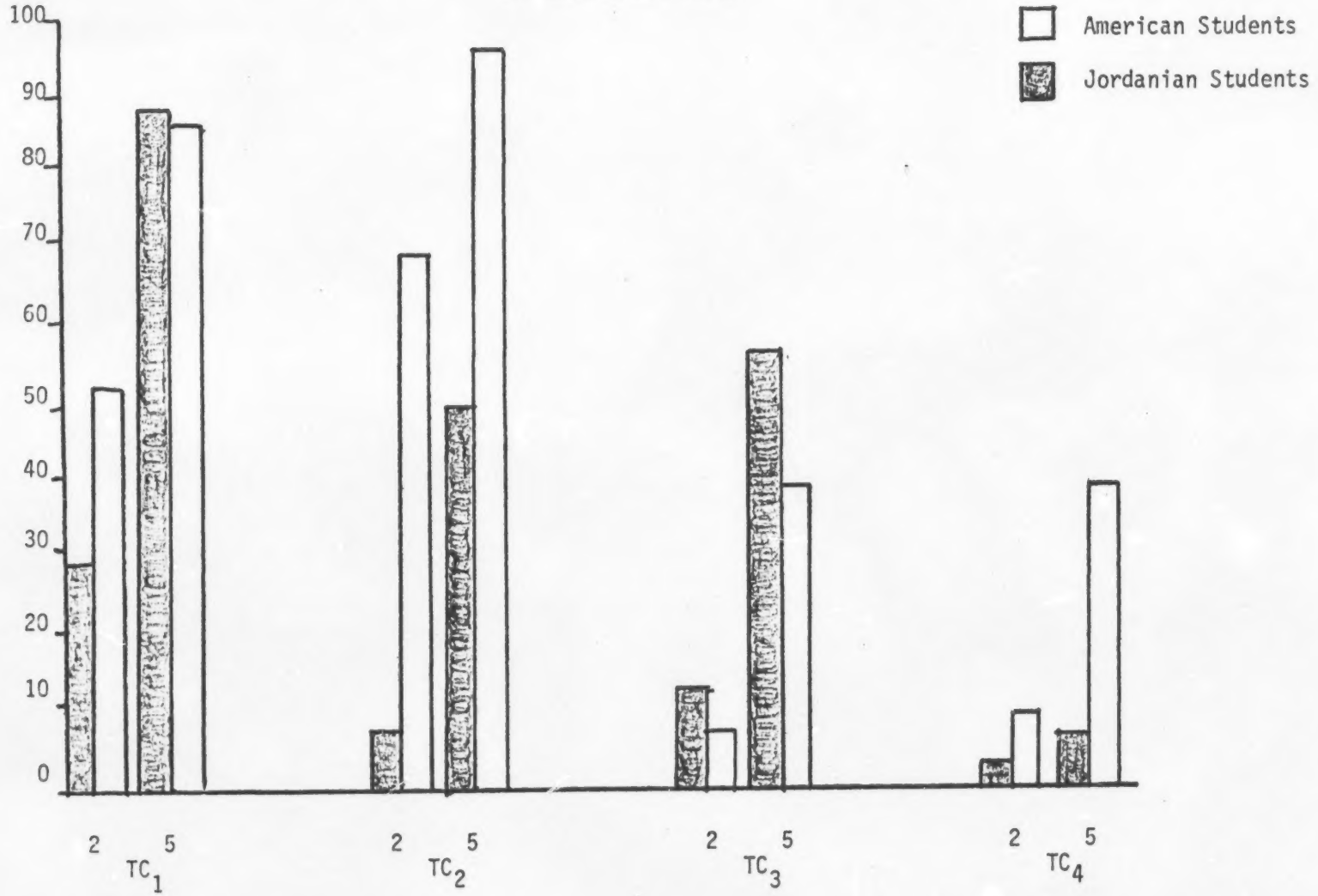

FIGURE 2

Percentage of Subjects

Performing Conventionally on Each Moral Judgment Tasks

in Each Grade Level

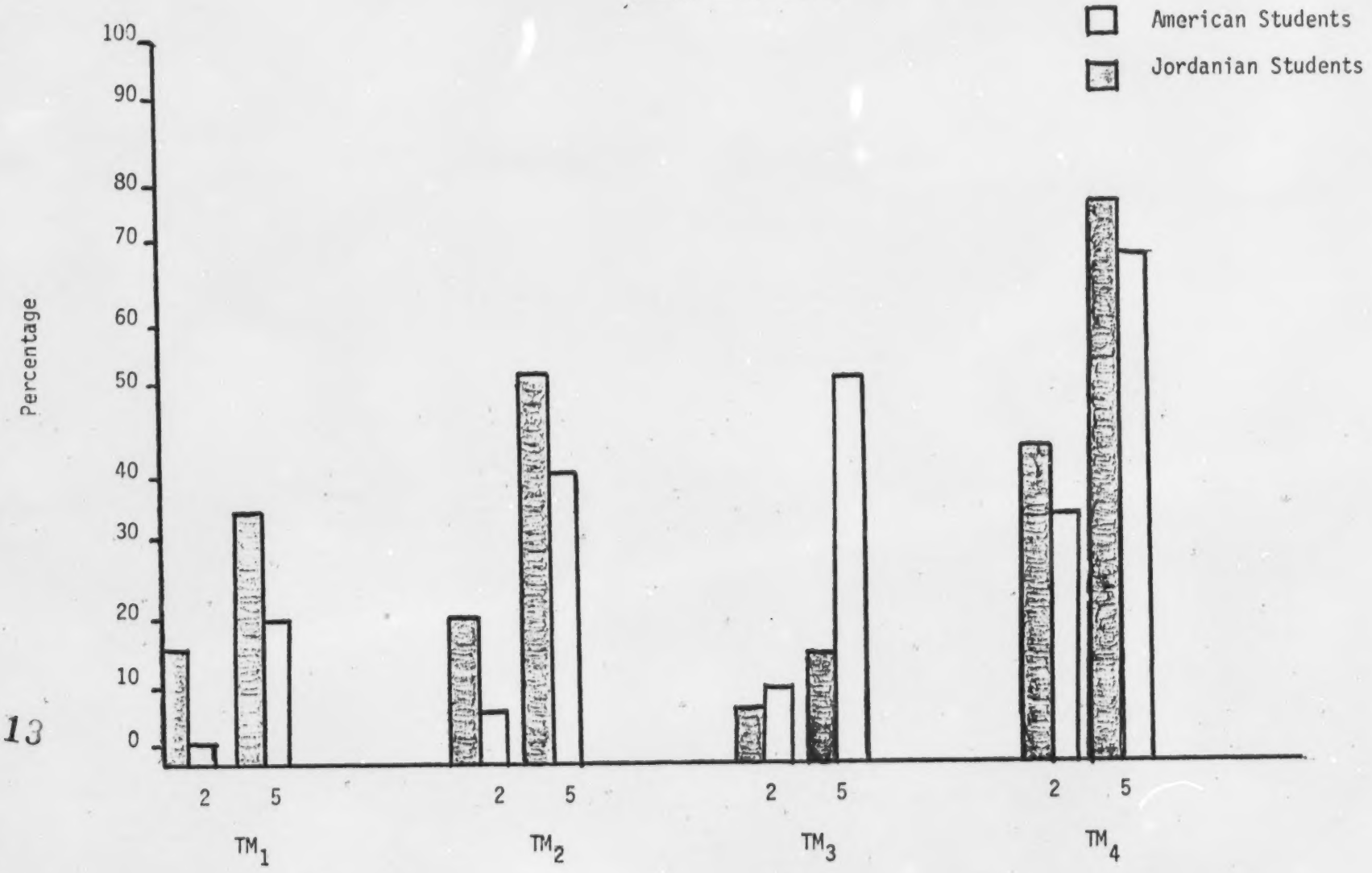

Table V

Test for Relationship (x^2) in Performance on
Cognitive and Moral Judgment Tasks Within Each Culture

	Jordanian Subjects				American Subjects			
	C_1	C_2	C_3	C_4	C_1	C_2	C_3	C_4
M_1	2.43	1.49	1.30	0.12	0.27	0.13	0.02	0.48
M_2	1.36	2.96	2.56	0.50	1.28	2.25	0.28	0.49
M_3	0.37	1.51	0.18	0.12	1.77	0.02	0.0	5.77 **
M_4	6.49**	5.04*	0.03	0.15	0.01	0.21	1.92	3.20

df = 1
* significant at the .05 level
** significant at the .02 level

Conclusions

On the basis of the previously presented findings, it was concluded that grade level was a significant factor in determining success on the cognitive tasks. The experiences of individuals within the same age-range contribute to the development of cognitive skills.

The impact of an individual's total cultural environment contributes to one's moral development as the data have indicated. It was also concluded that cognitive-developmental moral reasoning is related to logical development, but how it is related is unclear. Studies of American subjects (Mays, 1974; Tomlinson-Keasey and Keasey, 1974) report a "lag" of the moral developmental stage with the parallel cognitive developmental stage. The findings of this study present an anomaly, namely that of moral development "leading" cognitive development in a non-American culture. By designing studies to investigate the relationship of logical and moral reasoning in varying cultural settings, researchers will be able to describe the cognitive-developmental moral reasoning processes as they actually operate in the environment of the individual.

Implications for Science Teaching

The comprehensive theories of Piaget and Kohlberg provide the best available working models to examine the students' perspectives of social issues that are related to the advancements in science. If the parallelism of these developmental theories is to be verified, the total instructional environment must provide equal opportunities for growth in the cognitive and moral reasoning areas.

The teaching of science and issues related to science would facilitate the development of logical and moral reasoning skills, which would promote developmental growth, both cognitively and morally. Such an approach would enhance a "holistic" approach in science education.

A facet in the methodology of the "holistic" approach is the multicultural classroom, in which the teacher needs to be cognizant of the non-universality of cultural values, while focusing on universal principles. Research in varying cultural environments examining the cognitive and moral development processes of individuals will provide methodological directions.

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